MULTI-BIT NON-VOLATILE INTEGRATED CIRCUIT MEMORY AND METHOD THEREFOR

ABSTRACT

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A non-volatile memory (10) includes at least two buried bit lines (45, 47) formed within a semiconductor substrate (12), a charge storage layer (18) overlying the semiconductor substrate (12); a control gate (26) overlying the charge storage layer (18); an insulating liner (30) overlying the control gate; and

10 first and second conductive sidewall spacer control gates (32, 34). Multiple programmable charge storage regions (42) and (41, 44) are created within the charge storage layer (18) beneath respective ones of the control gate (26) and the first and second sidewall spacer control gates (32, 34). Also, the non-volatile memory (10) is a virtual ground NOR type multi-bit flash EEPROM (electrically

15 erasable programmable read only memory). By using conductive sidewall spacers as the control gates, a very dense multi-bit non-volatile memory can be manufactured.